Wavelength Selective Optical Switch with Aligned Input and Output Substrates

ABSTRACT OF THE DISCLOSURE

A scalable optical switch that uses substrates to multiplex and demultiplex input and output optical signals for optical networks. The switch includes a plurality of input fibers each configured to carry a plurality of lambda signals, a first stack of substrates, each of the substrates coupled to one of the input fibers and configured to demultiplex the lambda signals received on the input fiber by wavelength respectively, a plurality of output fibers, and a switching matrix configured to switch the demultiplexed lambda signals from the first stack of substrates to the plurality of output fibers. In one embodiment, the switch further includes a second stack of substrates coupled between the switching matrix and the output fibers. Each of the substrates of the second stack is configured to multiplex the switched lambda signals onto one of the output fibers respectively. In an alternative embodiment, the second stack of substrates is replaced with a fixed mirror so that the input fibers can also be used as output fibers. In other embodiments of the invention, alignment plates are used to align the substrates of the first stack and/or the second stack respectively. In yet other embodiments, the optical switch of the present invention is scalable to form a large photonic switching system where individual switches are each used for specific bands or sub-bands of amplification.